

Claims

1. (currently amended): A self pressurized, by fluid thermal expansion or phase change (water to steam), fluid filled closed loop solar collector-collection system for delivering solar energy from a roof mounted collector panel to a ~~domestic~~-hot water tank including: a pressurization system capable of maintaining system pressures above atmospheric pressure to increase the boiling point of the heat transfer fluid; a pressurized fluid radiator/overflow/recovery apparatus to catch overflow heat transfer fluid and trapped air and return the fluid to the system by vacuum while keeping air out; a heat transfer fluid to air pressurized radiator and or solar collector pressure activated air vedampersnts to prevent the solar collectors from overheating during no flow conditions; ~~an a~~ water based antifreeze heat transfer fluid to prevent damage from freezing in winter environments; a flexible umbilical to connect solar collector and water tank heat exchanger together; a circulation pump; control system and ~~an double-walled-internal~~ heat exchanger which is adaptable to ~~existing-the~~ hot water tank, to deliver heat from the heat transfer fluid to the hot water tank.

2. (currently amended): A boiling activated pressurized radiator solar collector over-temperature protection system, which includes a pressurized fluid to air radiator/overflow/recovery apparatus to catch overflow heat transfer fluid and trapped air and return the fluid to the system using vacuum while keeping air out, utilizes no moving actuators, and includes a boiling gas/liquid separator, which allows steam ~~to reach a~~ condensed in the pressurized liquid to air radiator and allows condensed water to be returned-to-kept in the pressurized fluid loop, so the sun's heat energy is dissipated to the ambient air flowing over the pressurized radiator and when the collector boiling stops, the sun's heat energy is delivered to the circulating heat transfer fluid and then to the hot water tank fluid loop.

3. (currently amended): A pressure activated solar collector over-temperature protection system which utilizes solar collector air dampers as moving parts, including: a steam pressure activated mechanical actuator, which opens before the systems' regulated pressure is reached; and a set of damper valves, which control airflow over the solar collector panel, so when opened the sun's heat energy is dissipated to the flowing ambient air and then when the dampers are closed the sun's heat energy is delivered to the circulating heat transfer fluid loop and thus to the hot water tank.

4. (~~cancelled~~ currently amended): ~~A flexible umbilical assembly that carries and insulates the heat transfer fluid tubing while protecting it from the elements with a clamp on "clam shell" split pipe external covering and includes all electrical connections between the solar collector and the hot water tank.~~

5. (~~currently amended~~ currently amended): The system ~~according to~~ as in claim 1, ~~comprised of a~~ with a 220/115 VAC controller and pump and boiling activated over-temperature protection ~~according to claim 2.~~

6. (currently amended ~~currently amended~~): The system as in claim 1 comprised of a ~~The system according to claim 1, with a~~ 220/115 VAC controller and pump, with pressure activated over-temperature protection, ~~according to claim 3.~~

7. (currently amended ~~currently amended~~): ~~The~~ The system as in claim 1 or claim 2 ~~comprised of a~~ e system according to claim 1, with a photovoltaic panel and low voltage (12VDC) pump, with boiling activated over-temperature protection ~~according to claim 2.~~

8. (currently amended ~~currently amended~~): The system as in claim 1 or claim 3 ~~comprised of a~~ The system according to claim 1, with a photovoltaic panel and low

voltage (12VDC) pump, with pressure activated over-temperature protection according to claim 3.

9. (new) The system as in claim 2 comprised of a 220/115 VAC controller and pump and boiling activated over-temperature protection.

10. (new) The system as in claim 3 comprised of a 220/115 VAC controller and pump, with pressure activated over-temperature protection.

11. (new) The system as in claim 2 comprised of a photovoltaic panel and low voltage (12VDC) pump, with boiling activated over-temperature protection.

12. (new) The system as in claim 3 comprised of a photovoltaic panel and low voltage (12VDC) pump, with pressure activated over-temperature protection.